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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,507	03/01/2004	Albert Pierce	14435-004001/ VPI/03-12	1051
26161 7590 11/03/2008 FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			EXAMINER ZHOU, SHUBO	
			ART UNIT 1631	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/790,507	<b>Applicant(s)</b> PIERCE ET AL.	
	<b>Examiner</b> SHUBO (Joe) ZHOU	<b>Art Unit</b> 1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 6/12/08.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) 40-41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-39 and 42-44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/24/07 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Amendments***

Applicants' amendments and request for reconsideration in the response filed 6/12/08 are acknowledged and the amendments are entered. The amendment to the claims filed 9/24/07 is also entered.

Claims 1-44 are currently pending; claims 1-39 and 42-44 are under examination; and claims 40-41 have been previously withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim.

### ***Drawings***

The replacement sheet for Fig. 2 filed 9/24/07 is acknowledged and accepted.

### ***Specification***

The specification is objected to because of the following including informalities:

The new Abstract filed 6/12/08 is objected to because it appears to contain more than 150 words.

Appropriate correction is required.

### ***Claim Rejections-35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

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Claims 1-39 and 42-44 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

This rejection is reiterated from the previous Office action and modified in view of recent court decisions and the Office's guidelines for examination.

The claims are drawn to a method for manipulating structural data of ligands comprising: (1) providing a set of models, wherein each model comprises three-dimensional structural information for a ligand or ligand/macromolecule complex; wherein each model is related to the other models of the set by a homologous structural feature; (2) mapping spatial relationships between the models such that the models are superimposed with respect to the homologous structural feature; (3) identifying one or more pairs of matching bonds between ligands of the set, wherein the matching bonds comprise a bond of a first ligand (B 1) and a bond of a second ligand (B2) that are superimposed in step (2) such that (i) an atom at each end of the bond (B1) is within 1.8 angstrom of an atom at each end of the bond (B2), (ii) the bond (B1) and the corresponding bond (B2) are of the same bond order, and (iii) the bond (B1) and the corresponding bond (B2) are related by an angle of 30° or less; (4) selecting a plurality of subsets of atoms and/or bonds from each ligand; wherein each subset comprises a bond and/or, an atom connected to the matching bond; (5) generating output ligands, each output ligand comprising atoms and/or bonds of a first subset and atoms and/or bonds of a second subset, wherein the first subset and the second subset comprise atoms and/or bonds derived from opposite ends of the matching bond.

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Since claims 1-39 are drawn to a method involving judicial exception, the following analyses of facts of this particular patent application follows the rationales suggested in the Office's guidance to examiners under the Memorandum "Clarification of 'processes' under 35 USC § 101" (published May 15, 2008, available online [www.uspto.gov/web/patents/memorandum.htm](http://www.uspto.gov/web/patents/memorandum.htm)) and the "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (OG Notices: 22 November 2005, available from the US PTO website at <http://www.uspto.gov/web/offices/com/sol/og/2005/week47/og200547.htm>), which is incorporated in the MPEP 2106.IV.C.2.

Paragraph three of the Memorandum states:

*"Based on Supreme Court precedent<sup>1</sup> and recent Federal Circuit decisions, the Office's guidance to examiners is that a § 101 process must (1) be tied to another statutory class (such as a particular apparatus) or (2) transform underlying subject matter (such as an article or materials) to a different state or thing.<sup>2</sup> If neither of these requirements is met by the claim, the method is not a patent eligible process under §101 and should be rejected as being directed to nonstatutory subject matter."*

The methods of the instant claims are not tied to another statutory class (such as a particular apparatus) either explicitly or inherently. Nominal or token recitations will not suffice, e.g. displaying, inputting, obtaining, etc. See *ex parte Langemyr*; Appeal 2008-1495, decided May 28, 2008. Reciting another statutory class in the preamble does not make the invention tie to the statutory class. Furthermore, in the instant invention, there is no physical transformation because a process of manipulating structural data of compounds does not transform an article or physical object to a different state or thing. Therefore, at least for one embodiment, the claimed method is not a statutory process.

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Additionally, the Guidelines states:

*To satisfy section 101 requirements, the claim must be for a practical application of the § 101 judicial exception, which can be identified in various ways (Guidelines, p. 19):*

*- The claimed invention "transforms" an article or physical object to a different state or thing.*

*- The claimed invention otherwise produces a useful, concrete and tangible result.*

In the instant claims, there is no physical transformation for reasons set forth above, thus the Examiner must determine if the instant claims produce a useful, tangible, and concrete final result.

In determining if the instant claims have a useful, tangible, and concrete final result, the Examiner must determine each standard individually. For a claim to be "useful," the claim must produce a final result that is specific, substantial, and credible. For a claim to be "tangible," the claim must set forth a practical application of the invention that produces a real-world final result. For a claim to be "concrete," the process must have a final result that can be substantially repeatable or the process must substantially produce the same result again. Furthermore, the claim must be limited only to statutory embodiments. Thus, if the claim is broader than the statutory embodiments of the claim, the Examiner must reject the claim as non-statutory.

In the instant case, the invention does not produce a useful, concrete and tangible result. Specifically it does not produce a tangible result. Since the process merely manipulate structural data and perform a series of calculations without using or making available for use the results of the manipulation to enable its functionality and usefulness

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to be realized, it does not produce a tangible result. While the claims comprise a step of displaying ligands, it is not clear the ligands are displayed to a user. This could be mended by amending the claims to recite a step of outputting the final result to a user. However, applicant is cautioned against introducing new matter into the claims.

With regard to claims 42-44, drawn to an apparatus or article for performing the process of claims 1-39, since the process claims do not produce a useful, concrete and tangible result for reasons set forth above, the apparatus/article for performing the process does not produce a useful, concrete and tangible result for the same reasons.

Furthermore, claims 43-44 are drawn to an article comprising a machine readable medium storing instructions. Absent an explicit definition in the specification to indicate otherwise, an article is construed to include a computer readable medium storing instructions. While the instant specification does not explicitly define the scope of the limitation of "computer readable medium," one skilled in the art would understand that computer readable medium includes carrier wave, which is a signal. For example, Fickowsky et al., in US patent 6,090,555 (Date of Patent: July 18, 2000), define computer readable medium as being "a CD-ROM, floppy disk, tape, flash memory, system memory, hard drive, and a data signal embodied in a carrier wave." See column 14, claim 12. Bornstein et al., in US patent 6,1443,88 (Date of patent : Nov. 7, 2000) state, "The computer readable medium of the present invention generally includes a tape, a floppy disk, a CD ROM, a carrier wave. In a preferred embodiment, however, the computer readable medium of the present invention is a carrier wave." See column 8, lines 33-37.

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Therefore, at least one embodiment of the instant claims is drawn to carrier wave or a signal encoded thereon a computer program.

It was held by the court that claims that recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism, per se, and as such, are nonstatutory natural phenomena. O'Reilly, 56 U.S. (15 How.) at 112-14. Moreover, it does not appear that a claim reciting a signal encoded with functional descriptive material, e.g. a computer program, falls within any of the categories of patentable subject matter set forth in § 101. The following analysis on why such a signal encoded with functional descriptive material is nonstatutory subject matter is excerpted from the US PTO's "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (OG Notices: 22 November 2005, available from the US PTO website at <http://www.uspto.gov/web/offices/com/sol/og/2005/week47/og200547.htm>):

*First, a claimed signal is clearly not a "process" under § 101 because it is not a series of steps. The other three § 101 classes of machine, compositions of matter and manufactures "relate to structural entities and can be grouped as 'product' claims in order to contrast them with process claims." 1 D. Chisum, Patents §1.02 (1994). The three product classes have traditionally required physical structure or material.*

*"The term machine includes every mechanical device or combination of mechanical device or combination of mechanical powers and devices to perform some function and produce a certain effect or result." Corning v. Burden, 56 U.S. (15 How.) 252, 267 (1854). A modern definition of machine would no doubt include electronic devices which perform functions. Indeed, devices such as flip-flops and computers are referred to in computer science as sequential machines. A claimed signal has no physical structure, does not itself perform any useful, concrete and tangible result and, thus, does not fit within the definition of a machine.*

*A "composition of matter" "covers all compositions of two or more substances and includes all composite articles, whether they be results of chemical union, or of*



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*mechanical mixture, or whether they be gases, fluids, powders or solids.” Shell Development Co. v. Watson, 149 F. Supp. 279, 280, 113 USPQ 265, 266 (D.D.C. 1957), aff’d, 252 F.2d 861, 116 USPQ 428 (D.C. Cir. 1958). A claimed signal is not matter, but a form of energy, and therefore is not a composition of matter.*

*The Supreme Court has read the term “manufacture” in accordance with its dictionary definition to mean ‘the production of articles for use from raw or prepared materials by giving to these materials new forms, qualities, properties, or combinations, whether by hand-labor or by machinery.’ Diamond v. Chakrabarty, 447 U.S. 303, 308, 206 USPQ 193, 196-97 (1980) (quoting American Fruit Growers, Inc. v. Brogdex Co., 283 U.S. 1, 11, 8 USPQ 131, 133 (1931), which, in turn, quotes the Century Dictionary). Other courts have applied similar definitions. See American Disappearing Bed Co. v. Arnaelsteen, 182 F. 324, 325 (9th Cir. 1910), cert. denied, 220 U.S. 622 (1911). These definitions require physical substance, which a claimed signal does not have. Congress can be presumed to be aware of an administrative or judicial interpretation of a statute and to adopt that interpretation when it re-enacts a statute without change. Lorillard v. Pons, 434 U.S. 575, 580 (1978). Thus, Congress must be presumed to have been aware of the interpretation of manufacture in American Fruit Growers when it passed the 1952 Patent Act.*

A manufacture is also defined as the residual class of product. 1 Chisum, § 1.02[3] (citing W. Robinson, The Law of Patents for Useful Inventions 270 (1890)). A product is a tangible physical article or object, some form of matter, which a signal is not. That the other two product classes, machine and composition of matter, require physical matter is evidence that a manufacture was also intended to require physical matter. A signal, a form of energy, does not fall within either of the two definitions of manufacture. Thus, a signal does not fall within one of the four statutory classes of § 101.

[.....]

*These interim guidelines propose that such signal claims are ineligible for patent protection because they do not fall within any of the four statutory classes of § 101. Public comment is sought for further evaluation of this question.*

Thus, claims 43-44 are drawn to nonstatutory subject matter.

### ***Claim Rejections-35 USC § 112***

The following is a quotation of the **second** paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-39 and 42-44 are rejected under 35 U.S.C. 112 , second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 in step (1) recites a “a set of models, wherein each model comprises three-dimensional structural information ... wherein each model is related to the other models of the set by a homologous structural feature.” The term "homologous" is a relative term that renders the claim indefinite. The term is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. When the 3-D structures of two molecules are compared, some part of the molecules might share the same atoms at corresponding positions, and some different atoms might share the same spatial shape or form. Without an explicit standard or criteria for determining whether two structures are homologous, it would not be clear to one skilled in the art what structures are homologous and what are not.

The metes and bounds of the claimed inventions in other claims reciting homologous structural feature, such as claim 39, are unclear, and the claims are thus rejected for the same reasons set forth above.

Applicant in the response filed 9/24/07 argues that the specification provides guidance and examples of homologous features used in the invention in the paragraph beginning on page 11, line 5. A review of page 11, line 5 reveals no guidance in determining homologous features. Furthermore, even if examples are given, without a

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clear standard or criteria is set for determining homologous features, one of ordinary skill in the art would not be apprised of the scope of the invention.

Other rejections of the claims set forth in the previous Office action are withdrawn in view of applicant's amendment to the claims filed 9/24/07.

Clarification of the metes and bounds of the claims is requested.

### ***Conclusion***

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shubo (Joe) Zhou, whose telephone number is 571-272-0724. The examiner can normally be reached Monday-Friday from 8 A.M. to 4 P.M. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marjorie Moran, can be reached on 571-272-0720. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Shubo (Joe) Zhou/

SHUBO (JOE) ZHOU, PH.D.

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PRIMARY EXAMINER